

## Claims

1. An interleaver/de-interleaver, comprising:
  - an initial value selector configurable to select an initial value from a programmable set of initial values;
  - an offset selector coupled to the initial value selector, the offset selector is configurable to select an offset value from a set of programmable offset values;
  - a pruning adjuster coupled to the offset selector, the adjuster is configurable to modify the offset value;
  - a boundary regulator coupled to the initial value selector, the offset selector, and the pruning adjuster, the boundary regulator is configurable to ensure a combination of the initial value with a selected offset value or a modified offset value are within a pre-determined index boundary; and
  - a controller coupled to the initial value selector, the offset selector, and the pruning adjuster, the controller asserts control signals provided to the initial value selector, the offset selector, and the pruning adjuster, such that a plurality of interleaving/de-interleaving algorithms are executable.
2. The interleaver/de-interleaver of claim 1 wherein the initial value selector and the offset selector comprise multiplexers.

3. The interleaver/de-interleaver of claim 2 wherein the offset selector further comprises one or more accumulator/subtractors.
4. The interleaver/de-interleaver of claim 1 wherein the controller accesses a programmable table having adjustment values used by the boundary regulator.
5. The interleaver/de-interleaver of claim 1 wherein the pruning adjuster is configurable to adjust the value of the combination of the initial value with the selected offset value or the modified offset value.
6. The interleaver/de-interleaver of claim 1 further comprising a combining block coupled to the initial value selector, the offset selector, the pruning adjuster, and the boundary regulator, wherein the combining block is configurable to combine the initial value with the selected offset value or the modified offset value.
7. The interleaver/de-interleaver of claim 1 further comprising a parameter received by at least one selected from the group consisting of the initial value selector, the offset selector, the pruning adjuster, the boundary regulator, and the controller.
8. The interleaver/de-interleaver of claim 7 wherein the parameter is selected from the group consisting of:

- an initial vector input to the initial value selector;
- an initial vector selection control input to the initial value selector;
- an offset vector input to the offset selector;
- an accumulator/subtractor initial value input to the offset selector;
- an accumulator/subtractor update rate input to the offset selector;
- an adjustment value input to the boundary regulator;
- a subtract value input to the boundary regulator and the offset selector;
- a multiplexer select line control input to the initial value selector;
- a multiplexer select line control input to the offset selector;
- a number of address pointers value;
- a burst index calculation; and
- a code of blocks index calculation.

9. The interleaver/de-interleaver of claim 1 wherein the boundary regulator comprises an addition/subtraction block.

10. A method for interleaving/de-interleaving, comprising:

- receiving a configurable initial value;
- receiving a configurable offset value;
- combining an offset with the initial value;
- outputting an index value using the combination of the offset value with the initial value; and

receiving changeable parameter values for a set of fixed parameters such that an interleaver/de-interleaver outputs an index according to a plurality of interleaving/de-interleaving techniques.

11. The method of claim 10 further comprising adjusting the offset value according to one of the parameter values.
12. The method of claim 10 further comprising adjusting the combination of the offset with the initial value according to one of the parameter values.
13. The method of claim 12 wherein adjusting the combination of the offset with the initial value comprises accessing a look-up table that contains adjustment values.
14. The method of claim 10 further comprising finishing a burst of data before starting another burst of data.
15. The method of claim 10 further comprising inputting a linearly increasing index as a sequence of initial values.
16. The method of claim 10 further comprising outputting a linearly increasing index.

17. A storage medium containing processor-readable instructions that are executable by a processor and cause the processor to:

receive parameter values of a set of parameters, the set of parameters are used to implement a plurality of interleaving/de-interleaving techniques;

select an initial value according to one of the parameters;

select an offset value according to one of the parameters;

combine the initial value with an offset; and

output an index value associated with the combination of the initial value and the offset.

18. The storage medium of claim 17 wherein the processor-readable instructions further cause the processor to adjust the selected offset value according to one of the parameters.

19. The storage medium of claim 17 wherein the processor-readable instructions further cause the processor to adjust the combination of the initial value with the offset according to one of the parameters.

20. A system, comprising:

means for inputting values of parameters that describe a plurality of interleaving/de-interleaving techniques;

means for selecting an initial value from one of the parameters;

means for selecting an offset value from one of the parameters;

means for combining the initial value with an offset; and  
means for outputting an index value associated with a combination of the initial value with the offset as an index location for a bit of data.

21. The system of claim 20 further comprising means for modifying the offset value according to one of the parameters.

22. The system of claim 20 further comprising means for modifying the combination of the initial value with the offset according to one of the parameters.

23. An apparatus, comprising:  
a processor;  
a memory coupled to the processor; and  
a transceiver coupled to the processor, wherein the transceiver includes an interleaver/de-interleaver configurable for use with a plurality of interleaving or de-interleaving techniques according to an updatable set of parameter values.

24. The apparatus of claim 23 wherein the interleaver/de-interleaver comprises an initial value selector that selects an initial value for use with an interleaving or de-interleaving technique.

25. The apparatus of claim 23 wherein the interleaver/de-interleaver comprises an initial value generator that generates an initial value for use with an interleaving or de-interleaving technique.
26. The apparatus of claim 23 wherein the interleaver/de-interleaver comprises an offset value selector that selects an offset value for use with an interleaving or de-interleaving technique.
27. The apparatus of claim 23 wherein the interleaver/de-interleaver comprises a offset adjuster for adjusting an offset value for use with an interleaving or de-interleaving technique.
28. The apparatus of claim 27 wherein the offset adjuster is configurable to automatically adjust the offset value for an interleaving or de-interleaving technique in accordance with bit pruning techniques of at least one interleaving or de-interleaving technique.